Correia Middle School Sports Complex Project
Draft EIR

Attachment I

Greenhouse Gas Assessment

Prepared by Ldn Consulting, Inc.

December 1, 2014

GREENHOUSE GAS ASSESSMENT

Correia Middle School Sports Complex Expansion Project

City of San Diego CA

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TABLE OF CONTENTS

TABLE OF CONTENTS II

LIST OF FIGURES III

LIST OF TABLES III

APPENDIX III

LIST OF ACRONYMS IV

EXECUTIVE SUMMARY V

1.0 INTRODUCTION 1

1.1 PURPOSE OF THIS STUDY 1
1.2 PROJECT LOCATION 1
1.3 PROJECT DESCRIPTION 1
1.4 SPORTS COMPLEX OPERATIONS 5

2.0 EXISTING ENVIRONMENTAL SETTING 9

2.1 UNDERSTANDING GREENHOUSE GASSES 9
2.2 EXISTING SETTING 9
2.3 CLIMATE AND METEOROLOGY 9

3.0 CLIMATE CHANGE REGULATORY ENVIRONMENT 11

3.1 REGULATORY STANDARDS (ASSEMBLY BILL 32) 11
3.2 REGULATORY STANDARDS (SENATE BILL 97) 12
3.3 REGULATORY STANDARDS (ASSEMBLY BILL 341) 12
3.4 ENERGY INDEPENDENCE AND SECURITY ACT OF 2007 13
3.5 AB 1493 (PAVLEY STANDARDS) 13
3.6 EXECUTIVE ORDER S-01-07 14
3.7 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) SIGNIFICANCE THRESHOLDS 15
3.8 GREENHOUSE GAS EARLY ACTION REDUCTION MEASURES 16
3.9 CITY OF SAN DIEGO CONSERVATION ELEMENT 17
3.10 SANDAG – CLIMATE ACTION STRATEGY 19
3.11 SAN DIEGO IMPACT THRESHOLDS 20

4.0 METHODOLOGY 22

4.1 CONSTRUCTION CO_2E EMISSIONS CALCULATION METHODOLOGY 22
4.2 OPERATIONAL VEHICULAR EMISSIONS CALCULATION METHODOLOGY 23
4.3 ELECTRICITY USAGE CALCULATION METHODOLOGY 24
4.4 SOLID WASTE EMISSIONS CALCULATION METHODOLOGY 24
4.5 WATER USE EMISSION CALCULATION METHODOLOGY 25

5.0 FINDINGS 27

5.1 PROJECT RELATED CONSTRUCTION EMISSIONS 27
5.2 PROJECT RELATED OPERATION VEHICULAR EMISSIONS 27
5.3 PROJECT RELATED ELECTRICITY USE 28
5.4 PROJECT RELATED SOLID WASTE EMISSIONS GAS USAGE 28
5.5 PROJECT RELATED WATER USAGE 29
5.6 PROJECT CUMULATIVE TOTALS 30

6.0 CERTIFICATIONS 31

List of Figures

FIGURE 1-A: PROJECT VICINITY MAP 2
FIGURE 1-B: PROPOSED SITE LAYOUT 3

List of Tables

TABLE 1-1: TYPICAL HIGH SCHOOL STADIUM USAGE 7
TABLE 3.1: EQUIVALENT EMISSION REDUCTIONS FROM ADOPTED PAVLEY 1 AND 2 REGULATIONS IN 2020 14
TABLE 3.2: ADOPTED DISCRETIONARY MEASURES 16
TABLE 4.1: EXPECTED CONSTRUCTION EQUIPMENT 23
TABLE 4.2: AVERAGE WASTE BREAKDOWN AND EMISSION RATES 25
TABLE 5.1: EXPECTED CONSTRUCTION EMISSIONS SUMMARY 27
TABLE 5.2: TOTAL GHG EMISSIONS FACTORS (ELECTRICITY USAGE) 28
TABLE 5.3: TOTAL GHG EMISSIONS FACTORS (SOLID WASTE) 29
TABLE 5.4: TOTAL GHG EMISSIONS FACTORS (ELECTRICITY FROM WATER USAGE) 29
TABLE 5.5: EXPECTED CO_2E EMISSIONS SUMMARY 30

Appendix

URBEMIS 2007 32
EMFAC2007 2020 INPUT/OUTPUT 40

LIST OF ACRONYMS

Assembly Bill 32 (AB32)

Business as Usual (BAU)

California Air Pollution Control Officers Association's (CAPCOA)

California Air Resource Board (CARB)

California Climate Action Registry General Reporting Protocol Version 3.1 (CCARGRPV3.1)

California Energy Commission (CEC)

California Environmental Quality Act (CEQA)

Carbon Dioxide (CO2)

Cubic Yards (CY)

Environmental Protection Agency (EPA)

Green House Gas (GHG)

Low Carbon Fuel Standard (LCFS)

Methane (CH4)

Nitrous Oxide (N2O)

San Diego Air Basin (SDAB)

San Diego Air Pollution Control District (SDAPCD)

Senate Bill 97 (SB97)

Vehicle Miles Traveled (VMT)

EXECUTIVE SUMMARY

This analysis has been completed in order to quantify Green House Gas (GHG) emissions from the project site and was prepared according to guidelines established within the California Global Warming Solutions Act of 2006 – Assembly Bill 32 (AB32), Senate Bill 97 (SB97), California Environmental Quality Act (CEQA), which is acceptable in the City of San Diego. Greenhouse Gasses analyzed in this study are Carbon Dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_2O). To simplify greenhouse gas calculations, both CH_4 and N_2O are converted to equivalent amounts of CO_2 and are identified as CO_2e. In other words CO_2e is an equivalent volume or mass of CO_2 converted from global warming potentials of other gases that may cause equivalent warming.

The Correia Sports Field renovation project at the Correia Middle School site is located within the City of San Diego. The proposed project is the construction and operation of a new Sports Complex on the Correia Middle School campus. The complex would include an improved baseball field (including additional bleachers and a concession stand with restroom facilities), track and field facilities (including a long jump pit), four multi-purpose fields (including artificial turf with an irrigation type cooling system), new classroom and restroom buildings, and installation of ten field lighting poles and fixtures. The project would require less than 20,000 CY of earthwork with about 7,000 CY of construction debris and excess soil to be exported offsite. Altogether, if the project is expected to begin early 2017 and be completed early 2018.

The proposed project will emit GHGs directly through the burning of carbon-based fuels such as gasoline and through the usage of electricity, water and from the anaerobic bacterial breakdown of organic solid waste. Cumulatively, the project will emit approximately 513 Metric Tons of CO2e each year. This is below the CAPCOA and City of San Diego acceptable 900 Metric Ton screening threshold and no project related design features would be required.

1.0 INTRODUCTION

1.1 Purpose of this Study

The purpose of this Green House Gas Assessment (GHG) is to show conformance to the California Global Warming Solutions Act of 2006 – Assembly Bill 32 (AB32) and Senate Bill 97 (SB97). AB32 requires that by 2020 the state's greenhouse gas emissions be reduced to 1990 levels and SB97 a "companion" bill directed amendments to the California Environmental Quality Act (CEQA) statute to specifically establish that GHG emissions and their impacts are appropriate subjects for CEQA analysis. Should impacts be determined, the intent of this study would be to recommend design measures for compliance with AB 32.

1.2 Project Location

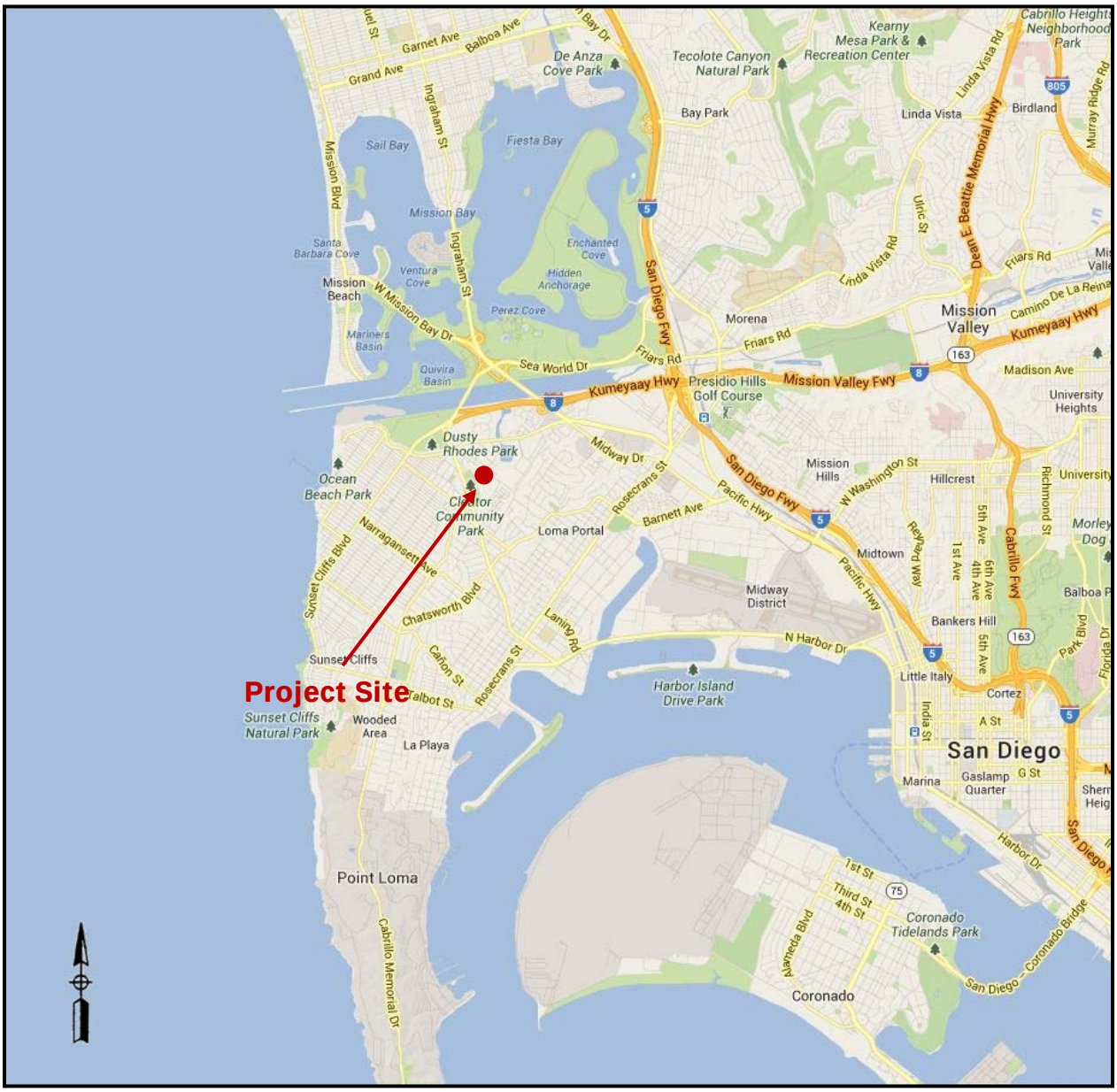
The proposed project is located on the San Diego Unified School District's Correia Middle School Campus within the City of San Diego. The project is bounded by Famosa Blvd Drive to the southeast, Valeta Street to the northeast, and a park along Nimitz Boulevard to the southwest. Access to the project is provided via Valeta Street. A general project vicinity map is shown in Figure 1–A on the following page.

1.3 Project Description

The Proposed Project is the construction and operation of a new Sports Complex on the Correia Middle School campus. The complex will include: 1) a natural turf softball field that can also accommodate field sports in the outfield area; 2) an artificial turf play field with multiple markings for either one football field or a combination of two other field sports; and, 3) a hard court play area. Additional project features will include: a long jump pit; a classroom/team room building; a restroom/ concession/storage building; sports field lighting of the natural and artificial turf play areas; a new paved pedestrian walkway connecting the different sports venues; a new electrical service; new field irrigation and cooling infrastructure; and, landscaping.

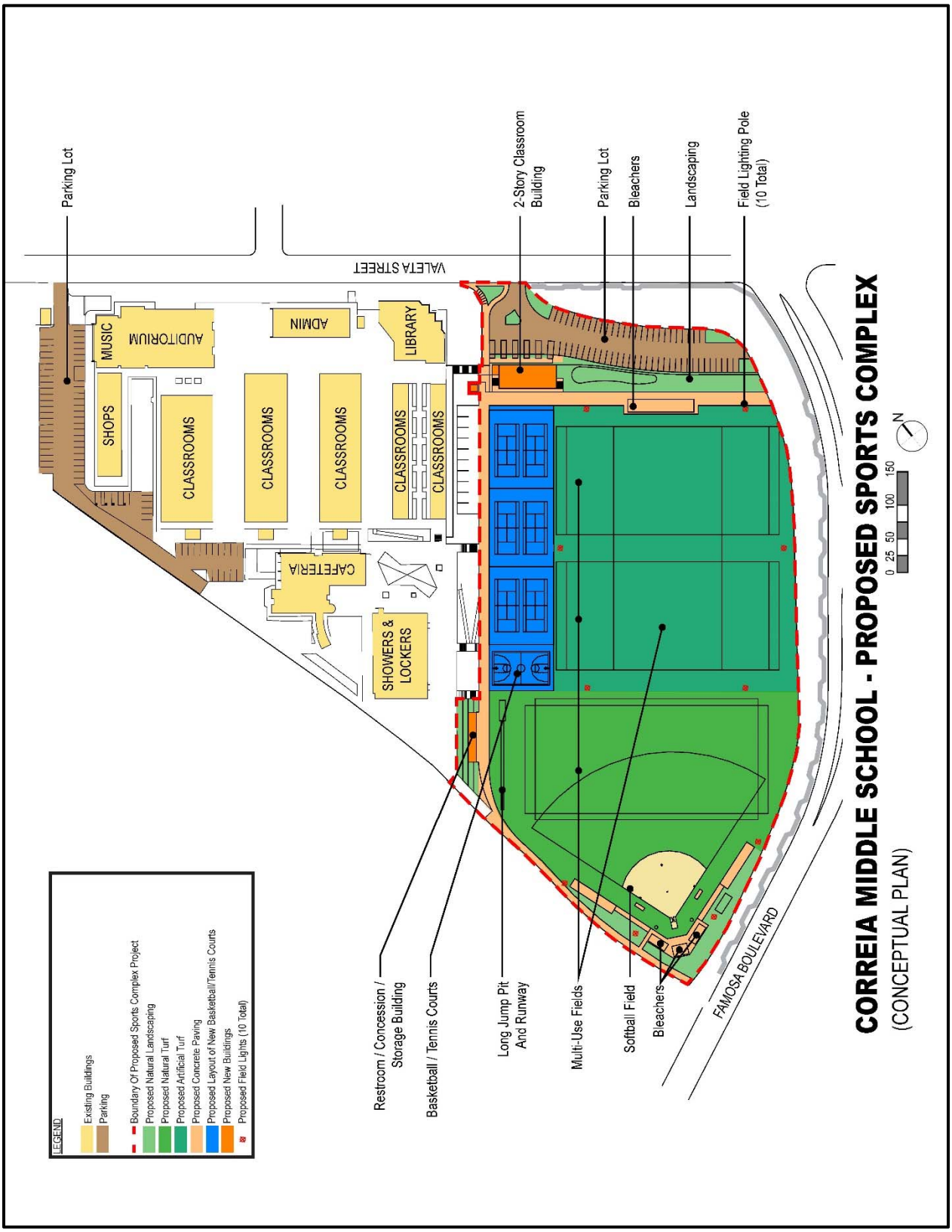
During school hours, the Proposed Project will only be available for use by Correia students. After school hours, the complex will be open to use by Correia students and limited use by Point Loma High School students, and could also be rented on a limited basis to public and private sports teams/clubs for community use on evenings and weekends in accordance with the District's Administrative Procedures No. 9205 and 9229. The Site plan is shown in Figure 1–B on Page 3 of this report. The physical layout of the proposed Sports Complex includes multi-use fields, a new baseball field, new hard courts, long jump pit, new buildings, field lighting, and new landscaping.

Figure 1-A: Project Vicinity Map



Source: Google Maps, 2013

Figure 1-B: Proposed Site Layout



The following describes the specific development components proposed within the new complex:

1. Multi-use Fields

   The artificial turf portion of the sports complex will be provided with markings for two parallel playfields with their long dimensions in the northwest/southeast orientation and a superimposed playfield with its long dimension oriented in the southwest/northeast direction. The parallel fields will be marked for lacrosse (330' long x 180' wide), soccer (300' long a 180' wide) and field hockey (300' long x 180' wide) and the perpendicular field will be marked for football (360' long x 160' wide). All fields meet the size requirements of the National Federation of State School Association's standards for competitive play areas;

   The equipment for the multi-use fields will include: removable football goal posts; removable soccer goals; removable lacrosse goals; removable field hockey goals; and, associated corner markers for each sport, as appropriate; and, One set of portable five (5) row aluminum bleachers (300 seats) will be placed along the northeastern end of the multi-use field.

2. Softball Field (replace the existing baseball field)

   The natural turf portion of the sports complex will include a softball field with: 60' base paths; a 250' outfield fence line; and 25' wide foul areas. The softball field will be positioned so that the turf area beyond the skinned infield can be used to accommodate field sport play, including football (360' x 160') or an oversized soccer field (360' x 200'); The softball field will be provided with: an illuminated scoreboard; roofed dugouts and fence-enclosed bullpens; and new aluminum bleachers (not to exceed the seating capacity of the existing baseball field currently occupying the site [approximately 200 seats.

3. Hard Court Area

   Six tennis courts with fence enclosure; and,
   One basketball court.

4. Field Lighting

   Based on preliminary design, ten light poles are proposed to provide field lighting at multiple locations within the field. Figure 1-3 depicts the proposed location of each of

the poles. Pole heights will range from 70 and 80 feet in height (2 @ 70' and 8 @ 80'). Each pole will support an array of 5-12 1,500W light fixtures (total of 92 fixtures). In addition, each fixture will be fitted with an external visor to reduce glare and a reflective insert to focus light onto the playing field.

5. Additional Features

Long jump pit and runway, including a rubberized runway and a sand landing pit;
Approximately 6,200 square foot two-story classroom/team room building and related parking lot improvements (this building will replace two existing portable classroom buildings and one portable restroom located in the same area);

Approximately 1,000 square foot concession/restroom/equipment storage building located for convenient access to and from the play fields and spectator areas;
A handicap accessible concrete walkway extending from the sports complex entrance to the softball field, the multi-use play areas and the hard court area as well as the two new buildings; and,

A new 480 volt electrical service to provide the power required for the field lighting and the new structures.

1.4 Sports Complex Operations

Currently, athletic events at Correia Middle School are possible only during daylight hours. These existing events include school physical education programs and softball games. With development of the Proposed Project, the new permanent field lighting will allow for sporting events, such as team practices and community league sports team events to be held at night after school hours. In addition, the Proposed Project will be available for weekend rentals by non-school related sports leagues as allowed under the District's Administrative Procedures No. 9205 and 9229 (i.e., soccer, youth sports, etc), as well as special District events such as school graduation events.

As such the Proposed Project is anticipated to accommodate expanded uses of the facility. These uses can include school related practices and competitions (games); special events such as graduation and pep rallies; community uses (like club sports) and events (such as ASB events); and other various uses. The expanded use of the Proposed Project is expected to occur due to increased demand (resulting from an expanding athletic program and because the new field may be preferred over other older fields) and because the lights will accommodate usage after sunset.

Approving and scheduling uses of the Proposed Project is under the ultimate authority of the Board of Education. However, the Principal will have responsibility for coordinating and scheduling day-to-day usage. The schedule for using the Proposed Project will have the potential to change every year as athletic programs expand and change, and as different community needs and events are identified. Therefore, it is difficult to forecast what the likely usage of the Proposed Project will be. In accordance with District Administrative Procedure No. 9205, school facilities are to be made available after 5 pm on school days and after 8 am on non-school days when the proposed outside use does not interfere with the District's educational program or maintenance of the facilities. Upon approval of the principal, school facilities may be made available before 5 pm on school days, even when school is in session, or before 8 am on non-school days, for groups and activities eligible for free use of facilities. Upon approval of the Rentals Office, Real Estate Department, facilities may be made available before 5 pm on school days after school is out for groups and activities not eligible for free use. The Proposed Project is proposed to be available for use any day of the week up until an 11:00 pm mandatory cutoff time for the lights. The typical uses associated with the Proposed Project are provided in Table 1-1. As shown in Table 1-1, various games, practices, and events are anticipated that would require the use of the field lights. Table 1-1 provides the typical ending time for those activities. The school would minimize the operation of the lights when they are not in use. The majority of these uses currently do not occur at the school but they are considered likely to occur with the implementation of the Proposed Project.

To provide a conservative assessment of potential impacts resulting from the use of the Proposed Project, this document considers the potential effects of usage of the complex on any day of the week. It was also assumed that the lights could be used any day up to 11:00 pm

Third Party Use of the Sports Complex

The District may allow third parties to utilize the Proposed Project. The District in July 2014 revised Administrative Procedure 9229 regarding use of District athletic fields and lighted stadiums in accordance with the Civic Center Act. Under the Civic Center Act, organizations, clubs, and associations formed for recreational, educational, political, economic, artistic or moral purposes are permitted by state law and district policy to use school buildings and grounds. "Civic Center use" must be subordinate to and not interfere with the instructional program or other public school purposes. Such use may be on either a free or a rental-charge basis. Upon receipt of a facilities use request from an outside group, the District shall consider whether the proposed use is appropriate for the requested facility; considering the potential impact on the school and the community, the availability of sufficient parking, security, custodial services, restrooms and other services needed to

accommodate the use. The District may direct an outside group to that facility most appropriate for the proposed use, taking into account the above factors.

The Board of Education, in accordance with Administrative Procedure 9229, may adopt site-specific field use policies which take into consideration the specific needs and constraints of the campus; including the specific needs and practices of the school, the adequacy and condition of the facility, the physical location of the site, the needs of the community, the impact of the Proposed Project on the surrounding community, and the extent to which negative impacts to the surrounding community can be mitigated by the employment of reasonable restrictions. A site specific field use policy has not been developed for Proposed Project at Correia Middle School.

Table 1-1: Typical High School Stadium Usage

Use/Activity	Season	Number per Season*	Attendance	Typical Days	Typical Latest Time	Lights Likely to be Used
School District Uses						
Baseball Practice – Var, JV, Fresh	Any	Weekly	Low	Mon-Sat	8 pm	Y
Baseball Games– Var, JV, Fresh		150	Med	Mon-Sat	8 pm	Y
Correia Sports Teams		Weekly	Low	Mon-Sat	8 pm	Y
Graduation**	June	1	High	Any	6 pm	N
Other School Events	Any	>5	Med	Any	10pm	Y
Community Uses						
Youth Pop Warner Practice	Aug-Nov	70	Low	Mon-Sun	10pm	Y
Youth Pop Warner Game	Aug-Nov	5	Low-Med	Sat	10pm	Y
Youth Club Sports	Year round	Weekly	Low-Med	Any	10pm	Y
Adult Club Sports	Year round	Weekly	Low-Med	Any	10pm	Y
Community Events	Year round	Occasional	Low-Med	Any	10pm	Y

* All numbers are approximate.

**Graduation is an existing event at the school, there will be no change in this event.

Attendance: Low=<50; Med=50-300; High=300-1500+ attendees

Source: SDUSD and BRG Consulting, Inc., 2014.

Sports Complex Weekly Usage Estimate

To provide a conservative assessment of potential impacts resulting from the use of the Proposed Project, this document considers the potential effects of usage of the Proposed Project for school or third parties on any day of the week. It was also assumed that the lights could be used any day up to 11:00 pm. The typical, but not limited to, uses associated with a Sports Complex are provided in Table 1-1. The majority of these uses currently do not occur at the school but they are considered likely to occur with the implementation of the proposed Sports Complex.

To provide a conservative assessment of potential impacts resulting from the use of the proposed Sports Complex, this document considers the potential effects of usage of the complex on any day of the week. It was also assumed that the lights could be used any day up to 11 p.m. However, as shown on Table 1-1, even with a robust athletic program and some accommodation of other general uses, it is unlikely that intensive events, such as a highly attended event, will occur on a frequent basis.

The Proposed Project includes the following artificial lighting improvements: Musco Light-Structure Green™ sports lighting system throughout the site. Based on preliminary design, a total of ten light standards are proposed to be constructed on-site. Four (4) light standards will be constructed in the southern portion of the site to illuminate the upgraded softball field. Six (6) lighting standards are proposed at the perimeter of the three multi-use fields in the northern portion of the site, with two (2) lighting standards occurring at the southwestern portion of the fields, two (2) lighting standards at the northeastern portion of the fields, and two (2) lighting standards proposed at the northwestern and southeastern edges of the field. In total, 92 luminaires will be installed on the ten lighting standards proposed as part of the Proposed Project. In addition, each fixture will be fitted with an external visor to reduce glare and a reflective insert to focus light onto the playing fields.

The light fixtures on the ten proposed lighting poles are designed to be fully shielded and directed onto the athletic fields with no light spillage onto adjacent property. A mandatory cutoff of 11 pm will be established for use of the lights. As noted in Table 1-1, the latest events are anticipated to end by approximately 10 pm.

2.0 EXISTING ENVIRONMENTAL SETTING

2.1 Understanding Greenhouse Gasses

Greenhouse gases such as water vapor and carbon dioxide are abundant in the earth's atmosphere. These gases are called "Greenhouse Gases" because they absorb and emit thermal infrared radiation which acts like an insulator to the planet. Without these gases, the earth ambient temperature would either be extremely hot during the day or blistering cold at night. However, because these gases can both absorb and emit heat, the earth's temperature does not sway too far in either direction.

Over the years as human activities require the use of burning fossil fuels stored carbon is released into the air in the form of CO_2 and to a much lesser extent CO. Additionally, over the years scientist have measured this rise in Carbon Dioxide and fear that it may be heating the planet too. Additionally, it is thought that other greenhouse gases such as Methane and Nitrous Oxide are to blame.

Greenhouse Gasses of concern as analyzed in this study are Carbon Dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_2O). To simply greenhouse gas calculations, both CH_4 and N_2O can be converted to an equivalent amount of CO_2 or CO_2e. CO_2e is calculated by multiplying the calculated levels of CH_4 and N_2O by a Global Warming Potential (GWP). The U.S. Environmental Protection Agency publishes GWPs for various GHGs and reports that the GWP for CH_4 and N_2O is 21 and 310, respectively.

2.2 Existing Setting

The Project site lies within an existing sports use area within the eastern section of the school property. The project site is mostly surrounded by residential uses. The project site has a chain-link security fence on perimeter of the lot. The average elevation of the site is roughly 55 to 60 feet above mean sea level.

2.3 Climate and Meteorology

Climate within the San Diego Air Basin (SDAB) area often varies dramatically over short geographical distances. Most of southern California is dominated by high-pressure systems for much of the year, which keeps San Diego mostly sunny and warm. Typically, during the winter months, the high pressure system drops to the south and brings cooler, moister weather from the north.

It is common for inversion layers to develop within high-pressure areas, which mostly define pressure patterns over the SDAB. These inversions are caused when a thin layer of the atmosphere increases in temperature with height. An inversion acts like a lid preventing vertical mixing of air through convective overturning.

Meteorological trends within the San Diego area generally mild with daytime highs typically ranging between 68ºF in the winter to approximately 79ºF in the summer with August usually being the hottest month. Median temperatures range from approximately 58ºF in the winter to approximately 73ºF in the summer. The average humidity is approximately 64% in the winter and about 75% in the summer (Source: http://www.city-data.com/city/San-Diego-California.html). San Diego usually receives approximately 10.42 inches of rain per year with February usually being the wettest month (Source: http://www.weather.com /weather/wxclimatology/monthly/graph/USCA0982).

3.0 CLIMATE CHANGE REGULATORY ENVIRONMENT

3.1 Regulatory Standards (Assembly Bill 32)

The Global Warming Solutions Act of 2006 (AB 32), requires that by 2020 the state's greenhouse gas emissions be reduced to 1990 levels or roughly a 28.3% reduction. Significance thresholds have not been adopted but are currently being discussed. AB 32 is specific as to when thresholds shall be defined. The pertinent sections are referenced within Part 4 of AB 32 Titled *Greenhouse Gas Emissions Reductions* are shown below:

Section 38560.5 (b) states:

On or before January 1, 2010, the state board shall adopt regulations to implement the measures identified on the list published pursuant to subdivision (a).

Section 38562 states:

(A) On or before January 1, 2011, the state board shall adopt greenhouse gas emission limits and emission reduction measures by regulation to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emissions limit, to become operative beginning on January 1, 2012.

(B) In adopting regulations pursuant to this section and Part 5 (commencing with Section (38570), to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit, the state board shall do all of the following:

1. *Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.*
2. *Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.*
3. *Ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this section receive appropriate credit for early voluntary reductions.*
4. *Ensure that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.*
5. *Consider cost-effectiveness of these regulations.*
6. *Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.*

7. *Minimize the administrative burden of implementing and complying with these regulations.*
8. *Minimize leakage.*
9. *Consider the significance of the contribution of each source or category of sources to statewide emissions of greenhouse gases.*

(C) In furtherance of achieving the statewide greenhouse gas emissions limit, by January 1, 2011, the state board may adopt a regulation that establishes a system of G-based declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gas emissions, applicable from January 1, 2012, to December 31, 2020, inclusive, that the state board determines will achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions, in the aggregate, from those sources or categories of sources.

(D) Any regulation adopted by the state board pursuant to this part or Part 5 (commencing with Section 38570) shall ensure all of the following:

1. *The greenhouse gas emission reductions achieved are real, permanent, quantifiable, verifiable, and enforceable by the state board.*
2. *For regulations pursuant to Part 5 (commencing with Section 38570), the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.*
3. *If applicable, the greenhouse gas emission reduction occurs over the same time period and is equivalent in amount to any direct emission reduction required pursuant to this division.*

3.2 Regulatory Standards (Senate Bill 97)

SB 97 requires the Office of Planning and Research to prepare and transmit to the Resources Agency, guidelines and directed amendments to the CEQA statute specifically for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions.

3.3 Regulatory Standards (Assembly Bill 341)

This bill makes a legislative declaration that it is the policy goal of the state that not less than 75% of solid waste generated be source reduced, recycled, or composted by the year 2020, and would require the department, by January 1, 2014, to provide a report to the Legislature that provides strategies to achieve that policy goal and also includes other specified information and recommendations.

This bill will increase diversion requirements by an additional 25% over Business as Usual as was defined under AB 939 and SB 1322 which were signed into law as the Integrated Waste Management Act of 1989, which as of the year 2000 only required 50 percent diversion.

3.4 Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 (P.L. 110-140, H.R. 6) is an energy policy law adopted by congress which consists mainly of provisions designed to increase energy efficiency and the availability of renewable energy. The law will require automakers to boost fleet wide gas mileage averages from the current 25 mpg to 35 mpg by 2020, which will reduce energy needs by 28.5%. This fleet wide average is known as the Corporate Average Fuel Economy (CAFE) standard.

3.5 AB 1493 (Pavley Standards)

AB 1493 regulations are similar to CAFE Standards however are expected to produce a Greenhouse Gas Benefit greater to that of the CAFE Standard and would be expected to double the amount of GHGs saved under CAFE. The Pavley rules or also referred to as California Standards are designed to regulate GHG emissions while the federal standards are aimed at reducing the nations' fuel consumption.

Under Pavley starting with vehicles produced in 2009, manufactures have the flexibility in meeting California standards through a combination of reducing tailpipe emissions of Carbon Dioxide, Nitrous Oxide, Methane and hydrofluorocarbons from vehicle air conditions systems. Furthermore, the California standards are estimated to increase fuel efficiency to 43 miles per gallon by 2020. The 2020 reductions are based on a more stringent emission limit than the current California Standards, Called the Pavley 2 Rule, as set forth in the California Climate Action Plan and committed to by the ARV in its Early Action Measures under AB32.

CARB staff recommends through example the use of more stringent emission reduction beginning in 2017 as well as applying more stringent standards through 2020. The percent reductions will be further discussed in the methodology section of this report. *(Source: Comparison of Greenhouse Gas Reduction for the United States and Canada under U.S. CAFE Standards and California Air Resources Board Greenhouse Gas Regulations – 2/2008)* otherwise referred to as CARB's Enhanced Technical Assessment on the relationship between CAFE standards and Pavley Standards.

This report utilized a baseline year of 2002 and calculated cumulative baseline equivalent GHG Reductions based on Pavley standards. One conclusion of the study finds that Pavley

reductions are as high as 20% from 2002 levels. Also, it should be noted that reductions under Pavley were not assumed from 2002 through 2008. In 2009 Pavley regulations went into effect and become more stringent with time which will require automobile companies to produce vehicles that generate less GHG emissions each year. The 20% reduction is calculated based on the fact that the overall baseline emissions over the 18 years averages out to 496,200 tons per day and cumulative reductions under Pavley reduce up to 100,500 tons per day or a 20% reduction. Table 3.1 below is a general duplicate of Table 11 within the CARB Enhanced Technical Assessment.

Table 3.1: Equivalent Emission Reductions from Adopted Pavley 1 and 2 Regulations in 2020

	PC/LDT1 (1000 tons per day)			LDT2 (1000 tons per day)		
Model Year	Baseline	%GHG Reduction	Tons Reduced	Baseline	%GHG Reduction	Tons Reduced
2008 and Older	80.19	0.0%	0.00	72.4	0.0%	0.00
2009	10.09	0.0%	0.00	7.49	0.9%	0.07
2010	11.17	3.5%	0.39	7.71	5.2%	0.40
2011	12.25	14.4%	1.76	7.98	12.0%	0.96
2012	13.46	25.3%	3.41	8.52	18.5%	1.58
2013	14.79	27.2%	4.02	9.35	19.9%	1.86
2014	15.95	28.8%	4.59	9.91	21.0%	2.08
2015	17.33	31.7%	5.49	10.89	23.0%	2.50
2016	18.25	34.3%	6.26	11.27	25.1%	2.83
2017	20.05	37.5%	7.52	12.43	30.0%	3.73
2018	22.12	40.7%	9.00	13.84	35.7%	4.94
2019	25.25	42.3%	10.68	15.76	39.1%	6.16
2020	29.37	43.9%	12.89	18.36	40.2%	7.38
Total	290.27		66.03	205.91		34.49
Grand Total	Baseline			496.2		
	Total Reduction			100.5		

3.6 Executive Order S-01-07

Executive Order S-01-07 was signed by Governor Arnold Schwarzenegger in January 2007 and is effectively known as the Low Carbon Fuel Standard or LCFS. The executive order seeks to reduce the carbon intensity of California's passenger vehicle fuels by at least 10% by 2020. The LCFS will require fuel providers in California to ensure that the mix of fuel they sell into the California Gas meet, on average, a declining standard for GHG emissions measured in CO_2e grams per unit of fuel energy sold.

On December 29, 2011, the United Stated District Court for the Eastern District of California issued an injunction preliminarily enjoining the California Air Resources Board (CARB) from enforcing the Low Carbon Fuel Standard (LCFS) adopted by the State of California, which standard is relied on in part in connection with the GHG analysis for the project. On April 23, 2012, the United States Ninth Circuit Court of Appeals granted a motion to stay the injunction issued by the lower court. As a result, CARB is continuing to enforce the existing LCFS. Based upon the uncertainty of LCFS implementation, the City of San Diego, however, continues to recommend that GHG evaluations omit the reductions attributable to the LCFS.

3.7 California Environmental Quality Act (CEQA) Significance Thresholds

As directed by SB 97, the Natural Resources Agency adopted Amendments to Title 14 Division 6 Chapter 3 CEQA Guidelines for greenhouse gas emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010. The pertinent sections are shown below:

Section 15064.4 - Determining the Significance of Impacts from Greenhouse Gas

(a) The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

1. *Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or*
2. *Rely on a qualitative analysis or performance-based standards.*

(b) A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

1. *The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;*
2. *Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.*
3. *The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the*

project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

General Questions recommended within the environmental checklist are:

(a) Will the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

(b) Will the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

3.8 Greenhouse Gas Early Action Reduction Measures

Per the requirements of AB 32, discrete early action greenhouse gas emission reduction measures are enforceable as of January 1, 2010 (Climate Change Scoping Plan – California Air Resource Board – December 2008). The Board adopted nine discrete early action items, which identified within the Scoping plan however; none of the discretionary measures requires specific action by the project at hand. The nine measures are identified in Table 3.2 below.

Table 3.2: Adopted Discretionary Measures

Row #	Scoping Plan Measure	Measure #	Page #
1	Ship Electrification at Ports	T-5	C-66
2	Limit High GWP Use in Consumer Products	H-4	C-179
3	Heavy-Duty Vehicle GHG Emission Reduction	T-7	C-73
4	Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing	H-1	C-175
5	SF6 Limits in Non-Utility and Non-Semiconductor Applications	H-2	C-176
6	Reduction of Perfluorocarbons in Semiconductor Manufacturing	H-3	C-177
7	Tire Pressure Program	T-4	C-63
8	Low Carbon Fuel Standard	T-2	C-64
9	Landfill Methane Control Measure	RW-1	C-160

Additionally, as stated in section 38562-A of AB 32, the state board adopted greenhouse gas emission limits and emission reduction measures on January 1, 2011 and started enforcing them on January 1, 2012. Currently, greenhouse gas emission limits for residential project

such as the proposed project have not been adopted, however, Section 38562-B-3 encourages projects producing large quantities of GHGs to voluntarily identify greenhouse gas reductions and receive appropriate credit for early voluntary reductions.

The City of San Diego requires all new projects exceeding 900 metric tons of GHGs per year demonstrate reasonable mitigation measures necessary to reduce those GHG's by 28.3% from business as usual.

3.9 City of San Diego Conservation Element

There are no specific local quantitative regulations that have been promulgated to control GHG emissions; however, both the City of San Diego and SANDAG have adopted policies and standards to reduce emissions in the area. The City of San Diego first adopted climate change policies in its *City of San Diego Climate Protection Action Plan* (City of San Diego 2005). That plan identified sources of GHGs within the City and identified policies and developed recommendations to reduce GHG emissions. The City of San Diego's General Plan (2008) addresses climate change in the Conservation Element of the plan. Policies that address local GHG mitigation strategies in San Diego are integrated within the General Plan, and applicable to development projects. Together, this collection of policies support and promote the adopted recommendations outlined in the City's Climate Protection Action Plan.

As part of the Conservation element, the City's policies pertinent and related to Climate Change and Sustainable Development from a private developer's perspective are:

CE.A.5

Employ sustainable or "green" building techniques for the construction and operation of buildings.

a. Develop and implement sustainable building standards for new and significant remodels of residential and commercial buildings to maximize energy efficiency, and to achieve overall net zero energy consumption by 2020 for new residential buildings and 2030 for new commercial buildings. This can be accomplished through factors including, but not limited to:

- *Designing mechanical and electrical systems that achieve greater energy efficiency with currently available technology;*
- *Minimizing energy use through innovative site design and building orientation that addresses factors such as sun-shade patterns, prevailing winds, landscape, and sun-screens;*
- *Employing self-generation of energy using renewable technologies;*

• Combining energy efficient measures that have longer payback periods with measures that have shorter payback periods;
• Reducing levels of non-essential lighting, heating and cooling; and
• Using energy efficient appliances and lighting.

b. Provide technical services for "green" buildings in partnership with other agencies and organizations.

CE.A.9:

Reuse building materials, use materials that have recycled content, or use materials that are derived from sustainable or rapidly renewable sources to the extent possible, through factors including:

a. Scheduling time for deconstruction and recycling activities to take place during project demolition and construction phases;
b. Using life cycle costing in decision-making for materials and construction techniques. Life cycle costing analyzes the costs and benefits over the life of a particular product, technology, or system;
c. Removing code obstacles to using recycled materials in buildings and for construction; and
d. Implementing effective economic incentives to recycle construction and demolition debris (see also Public Facilities Element, Policy PF-I.2).

CE.A.10:

Include features in buildings to facilitate recycling of waste generated by building occupants and associated refuse storage areas.

a. Provide permanent, adequate, and convenient space for individual building occupants to collect refuse and recyclable material.
b. Provide a recyclables collection area that serves the entire building or project. The space should allow for the separation, collection and storage of paper, glass, plastic, metals, yard waste and other materials as needed.

CE.A.11:

Implement sustainable landscape design and maintenance.
a. Use integrated pest management techniques, where feasible, to delay, reduce, or eliminate dependence on the use of pesticides, herbicides, and synthetic fertilizers.

b. Encourage composting efforts through education, incentives, and other activities.
c. Decrease the amount of impervious surfaces in developments, especially where public places, plazas and amenities are proposed to serve as recreation opportunities (see also Recreation Element, Policy RE-A.6 and A.7).
d. Strategically plant deciduous shade trees, evergreen trees, and drought tolerant native vegetation, as appropriate, to contribute to sustainable development goals.
e. Reduce use of lawn types that require high levels of irrigation.
f. Strive to incorporate existing mature trees and native vegetation into site designs.
g. Minimize the use of landscape equipment powered by fossil fuels.
h. Implement water conservation measures in site/building design and landscaping.
i. Encourage the use of high efficiency irrigation technology, and recycled site water to reduce the use of potable water for irrigation. Use recycled water to meet the needs of development projects to the maximum extent feasible. (see Policy CE-A.12).

CE.A.12:

Reduce the San Diego Urban Heat Island, through actions such as:

a. Using cool roofing materials, such as reflective, low heat retention tiles, membranes and coatings, or vegetated eco-roofs to reduce heat build-up;
b. Planting trees and other vegetation, to provide shade and cool air temperatures. In particular, properly position trees to shade buildings, air conditioning units, and parking lots; and
c. Reducing heat buildup in parking lots through increased shading or use of cool paving materials as feasible (see also Urban Design Element, Policy UD-A.12).

3.10 SANDAG – Climate Action Strategy

SANDAG's Climate Action Strategy is a guide for SANDAG on climate change policy. The Strategy identifies a range of potential policy measures for consideration as SANDAG updates long-term planning documents like the Regional Transportation Plan and Regional Comprehensive Plan, and as local jurisdictions update their General Plans and other community plans. The goals of the Climate Action Strategy include the reduction of vehicle miles traveled and use of alternatives modes of transportation.

SANDAG has also developed in accordance with California Senate Bill 375 (SB 375); the Sustainable Communities Strategy (SCS) is a new element of the 2050 Regional Transportation Plan (RTP).

The legislation requires Metropolitan Planning Organizations (MPO) to prepare a SCS as part of their RTPs, along with the traditional policy, action, and financial requirements. After

more than two years of extensive public input, the SANDAG Board of Directors adopted the final RTP with a SCS on October 28, 2011, making it the first agency in California to do so. The RTP was found to violate CEQA in December 2012.

The SCS lays out how the region will meet greenhouse gas (GHG) reduction targets set by the California Air Resources Board (CARB). CARB's targets call for the region to reduce per capita emissions seven percent by 2020 and 13 percent by 2035 from a 2005 baseline. There are no mandated targets beyond 2035.

Under SB 375, which went into effect in 2009, a SCS must demonstrate how development patterns and transportation network, policies, and programs can work together to achieve greenhouse gas emission reduction targets for cars and light trucks, if there is a feasible way to do so. If a MPO cannot meet the targets through a SCS, then the region is required to develop an alternative planning strategy that demonstrates how targets could be achieved. In essence, the SCS includes four building blocks:

1. *A land use component that accommodates the Regional Housing Needs Assessment (RHNA) and includes the protection of sensitive resources, including areas protected under habitat conservation plans;*
2. *Transportation networks including highways, transit, and local streets and roads;*
3. *Transportation demand management strategies; and*
4. *Transportation system management programs and policies.*

3.11 San Diego Impact Thresholds

The City's Significance Determination Thresholds do not identify quantitative thresholds for determining significance of GHG emissions. For the purpose of determining significance, the analysis below is based on guidance contained in Appendix G of the State CEQA Guidelines. Specific guidance on addressing GHG emissions is included in the latest adopted amendments to the State CEQA Guidelines (adopted in December 2009), which became effective on March 18, 2010. Based on Appendix G of the State CEQA Guidelines, GHG emission impacts would be significant if the project would:

- *Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; and/or*
- *Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.*

In order to serve as a guide for determining when a project triggers the need for a GHG significance determination, the City of San Diego has established an interim screening

threshold for GHG emission analysis. Based on guidance in the CAPCOA report "CEQA & Climate Change," dated January 2008, the City's memorandum entitled "Addressing Greenhouse Gas Emissions from Projects Subject to CEQA" (City of San Diego 2010) utilizes a screening threshold of 900 metric tons of CO_2e as a conservative threshold for requiring further analysis of GHG emissions. Projects with emissions above the 900-metric ton threshold are required to evaluate whether emissions can be reduced below "business as usual" levels. The City has proposed a target of 28.35 percent below "business as usual" as its significance threshold, based on the California ARB's Scoping Plan and year 2020 "business as usual" forecast model, which represents the GHG emissions that would be expected to occur without any GHG project reducing features or mitigation as mandated under AB 32.

In addition, the project's consistency with applicable plans, policies, and regulations adopted for the purpose of reducing the emissions of GHGs has been evaluated. Applicable state and federal plans, policies, and regulations that are currently in effect are discussed under Regulatory Setting above. The City has adopted policies in both its *Climate Protection Action Plan* and General Plan that directly address GHG emissions, setting a goal of a 15-percent reduction in GHG emissions by 2010. The City identified various sectors that contribute to GHG emissions, and actions to reduce those emissions to meet the goals of AB 32. Also, the City is in the process of preparing an updated Climate Action Plan.

These are interim thresholds and nonetheless, a good faith effort has been made to evaluate whether GHG impacts from the project are potentially significant, taking into account the type and location of the proposed development, the best available scientific data regarding GHG emissions, and the current statewide goals and strategies for the reduction of GHG emissions. It is important to note that the San Diego APCD has not provided any guidance on the quantification of GHG emissions or emissions thresholds for the San Diego Region, nor has the City of San Diego adopted any plan, policy, or regulation governing GHG emissions to date.

4.0 METHODOLOGY

4.1 Construction CO_2e Emissions Calculation Methodology

The project engineer expects all the grading to be complete in about six weeks. The first four weeks of grading will be considered "Mass Grading" and would include all grubbing of the site where all grass and old irrigation pipes will be removed and disposed of offsite. During the last two weeks of grading the contractor will finish grade the entire site to achieve optimal grades necessary for proper drainage. The grading operation would require no more than 20,000 CY of earthwork. Out of that quantity, about 7,000 CY would consist of construction debris and excess soil which will be exported offsite.
Also, during the last two weeks of grading, the contractor will use small tractors and trenchers to construct underground utility trenches for irrigation and utility lines.

After the site is prepared, the landscaping and construction of the sports facilities, concessions/restroom facility and the two story classrooms would begin. Construction would be expected to last up to 10 weeks. Altogether, if the project begins in February 2017, the construction would be completed roughly early February 2018.

During the grading period, roughly 7,000 CY of construction debris will be hauled offsite. It's expected that up to 500 round trips would be necessary using 14 CY trucks within a 20 mile radius during the earthwork period. Table 4.1 on the following page shows the expected timeframes and construction equipment which would be necessary for the project.

The schedule proposed would be considered a "fastest possible" construction duration for the entire project including classroom completion. Since emission thresholds are based on daily levels, this would be considered worst-case under CEQA. Also, for purposes of this analysis all material haulage would occur during the fine grading phase.

Table 4.1: Expected Construction Equipment

Equipment Identification	Proposed Dates Start - Finish	Quantity	Hours per day
Mass Grading (Including Construction Debris Export)	2/1/2017 – 2/28/2017		
Tractors/Loaders/Backhoes		2	8
Graders		1	8
Water Trucks		1	8
Fine Grading	3/1/2017 – 3/15/2017		
Tractors/Loaders/Backhoes		2	8
Graders		1	8
Water Trucks		1	8
Trenching	3/1/2017 – 3/15/2017		
Trenchers		3	8
Tractors/Loaders/Backhoes		2	8
Building Construction	3/16/2017 – 2/1/2018		
Welders		3	8
Forklifts		2	8
Cranes		1	8
Generator Sets		1	8
Tractors/Loaders/Backhoes		1	8
This equipment list is based upon equipment inventory within URBEMIS2007. The quantity and types are based upon assumptions from projects of similar size and scope in the City of San Diego.			

4.2 Operational Vehicular Emissions Calculation Methodology

Operational Emissions from daily trips will be quantified utilizing emission levels reported in grams/mile from the EMFAC2007 emission model for the year 2020. These estimates will then be tabulated to show the yearly emission levels generated by the project. All emission levels will then be multiplied by the daily mileage and then converted to metric tons for typical reporting consistency. Equation 1 below was utilized to determine GHG levels in Metric tons:

$$GHG(Metric\ Tons) = Emission\ Factor\left(\frac{g}{mile}\right) \times Annual\ Mileage \times 0.000001\left(\frac{Metric\ ton}{g}\right)$$

Operational emissions are within the development can reduced through reducing Project related Vehicle Miles Traveled (VMT). Methods to reduce these VMTs that have proven to be effective for a development of this type which would be to improve design elements to

enhance walk ability and connectivity by adding sidewalks on both sides of all roads, bike lanes and access to public transportation. The estimated reductions were calculated in the proposed project Air Quality assessment which are expected to be just over 7%. URBEMIS 2007 will be utilized to determine the appropriate reductions given the project design and relative proximity to alternative transportation.

4.3 Electricity Usage Calculation Methodology

Utilizing methodologies within the California Climate Action Registry General Reporting Protocol Version 3.1- January 2009 (CCARGRPV3.1) CO_2, CH_4, and N_2O from electricity use can be calculated utilizing equations III.6b which is shown below:

Equation III.6b (GHG= CO_2, or CH_4, or N_2O)

$$GHG(Metric\ Tons) = \frac{Electricity\ Use\ (kWh) \times Electricity\ Emission\ Factor\ \left(\frac{lbs\ GHG}{kWh}\right)}{2{,}204\ \frac{lbs}{metric\ ton}}$$

The electricity emission factors are published within Table C.2 within the CCARGRPV3.1 document and are broken out into sub region. The proposed project is located within California and for CO_2, CH_4, and N_2O the Electricity Emission Factors are 0.72412, 0.0000302 and 0.0000081, respectively.

Electricity from the project site will be dominated by the use of Sports Lighting. The project would permanently construct eight lighting poles each consisting of six 1000W luminaries for a total of 48 luminaries in total. It is assumed that the lights will operate 365 days per year for four hours per night. Given this, it is assumed that the project site will consume 70,800 kWh per year.

4.4 Solid Waste Emissions Calculation Methodology

Solid waste generated from the proposed project will ultimately be discarded as trash and then deposited into a landfill. The decomposition of organic matter such as food, paper, yard trimmings and wood are anaerobically digested by bacteria which primarily produces GHG's as a bi-product. However, organic decomposition occurs at different rates and is a function of the material content. The Environmental Protection Agency (EPA) published various emission rates with units of Metric Tons of Carbon Dioxide Equivalent per Ton (Source: Solid Waste management and Greenhouse Gases; A Life-Cycle Assessment of Emissions and Sinks).

Average waste generation mixes vary between land uses and it's difficult to estimate how much solid waste is generated per person utilizing the fields. Cal Recycle a published solid waste generation rates for large golf courses where events are held and it was determined that each person would generate roughly 0.5 lbs per day. A similar approach was taken on a per person basis where the average round trip was assumed to generate 4 people. Since the proposed project would generate 404 trips during the weekday and 1,430 tips during the weekend (a total of 179,804 tips per year) or 89,902 round trips per year.

Assuming that each trip produces 2 pounds of trash, the project would generate 179,804 lbs of trash each year or 89.9 tons of waste each year (Source: http://www.calrecycle.ca.gov /wastechar/wastegenrates /Service.htm). Table 4.2 identifies the typical mix ratio of which would most likely define the park waste stream (Source: California 2008 Statewide Waste Characterization Study – Cascadia Consulting Group, 2009). The best way to reduce this waste generation is to promote recycling.

Table 4.2: Average Waste Breakdown and Emission Rates

Waste Type	Waste Breakdown	Landfill Emission Factors ($MTCO_2e$ per Ton)
Special Waste	1.5%	0.42
Mixed Residue	2.5%	0.04
Paper	19.6%	0.35
Glass	2.4%	0.04
Metal	4.0%	0.04
Electronics	0.7%	0.04
Plastic	9.2%	0.04
Other Organics	48.6%	0.24
Inert and Other	11.2%	0.04
Household Hazardous Waste (HHW)	0.3%	0.40

4.5 Water Use Emission Calculation Methodology

Water used from the proposed project will indirectly utilize energy for preparation and conveyance of clean water to the project site. It is estimated that it takes 11,111 kWh per Million Gallons (MG) of energy to deliver treated potable water which also includes the energy required to treat that water within a treatment facility (Source: CAPCOA – Quantifying Greenhouse Gas Mitigation Measures, 8/10).

The proposed project will install artificial turf, however, will be wetting the turf during hot days to cool the turf to resemble natural grass. For this purpose, LDN assumes a normal water routine based on natural grass. Therefore, the water usage for 7.3 acre site can be estimated using the California Department of Water Resources (CDWR) 2009 Model Water Efficient Landscape Ordinance methodology utilizing the equation below:

$$Water_{baseline} = MAWA = ET0 \times 0.62 \times (0.7 \times LA) = 46.5 \times 0.62 \times 0.7 \times 47.3 \text{ acres} \times 43{,}560 \text{ SF/acre} = = 6{,}417{,}315.83 \text{ GPY}$$

Where:

$Water_{baseline}$ = Volume of water required to support the baseline lawn (gallons/year)
MAWA = Maximum Applied Water Allowance (gallons/year)
ET0 = 46.5 for San Diego (Annual Reference Evapotranspiration31 from Appendix A of CDWR 2009 (inches per year))
LA = Landscape Area (square feet)

Given these findings, the entire field area would be expected to utilize 6,417,315.83 GPY. Therefore, the estimated worst case energy use required to pump that water within a given year would require no more than 71,302.80 kWh each year. Utilizing methodologies within the California Climate Action Registry General Reporting Protocol Version 3.1- January 2009 (CCARGRPV3.1) CO_2, CH_4, and N_2O from electricity use can be calculated utilizing equations III.6b which is shown below:

Equation III.6b (GHG = CO_2, or CH_4, or N_2O)

$$GHG(Metric\ Tons) = \frac{Electricity\ Use\ (kWh) \times Electricity\ Emission\ Factor\ \left(\frac{lbs\ GHG}{kWh}\right)}{2{,}204\ \frac{lbs}{metric\ ton}}$$

The electricity emission factors are published within Table C.2 within the CCARGRPV3.1 document and are broken out into sub region. The proposed project is located within California and for CO_2, CH_4, and N_2O the Electricity Emission Factors are 0.72412, 0.0000302 and 0.0000081, respectively.

CO_2e generated from offsite sources in the production of electricity is much more difficult to mitigate however, the state and the utility companies are taking steps to become more energy efficient and utilizing renewable non-carbon based energy sources. The goals of SDGE (the proposed projects provider) are suggesting that 33% of the energy supplied to their customers would be from renewable sources. Under the BAU percentage reduction strategy of this report it is assumed that the utilities will increase renewable by up to 29% over the BAU starting period.

5.0 FINDINGS

5.1 Project Related Construction Emissions

Utilizing the URBEMIS 2007 inputs for the model as shown in Table 4.1 above, we find that grading and construction of the project will produce approximately 432.73 tons of CO_2 within 2017 and 2018. The URBEMIS model outputs are provided as Attachment A to this report. Given the fact that the total emissions will ultimately contribute to 2020 cumulative levels, it is acceptable to average the total construction emission over a 30 year period (Source: SCAQMD 2008). A summary of the construction emissions is shown in Table 5.1 below.

Table 5.1: Expected Construction Emissions Summary

Year	CO_2
Construction Total (2017+2018)	432.73
Yearly Average (2020)*	**14.42 tons/year over 30 years**
Yearly Average Metric Tons (2020)*	**13.09 Metric Tons/year over 30 years**

Expected Construction emissions are based upon URBEMIS modeling assumptions identified in Chapter 4 of this report.
* Total Construction related CO_2 averaged over a 30-year span.
Data is presented in decimal format and may have rounding errors.

5.2 Project Related Operation Vehicular Emissions

Based on the Project's traffic study the proposed Project could add as many as 404 daily trips on weekdays and up to 1,430 tips on the weekends. For purposes of this worst-case analysis, it's assumed that 52 days per year would generate 1,430 and 261 days per year would generate 404 daily trips once the Project is fully operational sometime in the year 2018. Project trip distribution and expected average trip distances were assumed to be typical for an urban setting in San Diego or 5.8 miles.

Given this, based on the yearly operations, the project would generate 1,042,863.2 VMT. In order to obtain a realistic approximation of the Business as Usual (BAU) baseline emissions, LDN Consulting ran the EMFAC 2007 model for 2020 which could be assumed to be BAU.

The EMFAC modeling results for 2020 are provided as ***Attachment B*** at the end of this report and follow methodologies utilized by the State as identified in Section of this report.

Emissions from EMFAC are then imputed into Equation 1 identified in Section 4.2. The estimated GHG emissions under a BAU scenario would be as high as 434.83 Metric Tons.

5.3 Project Related Electricity Use

Utilizing methodologies within the CCARGRPV3.1, CO_2, CH_4, and N_2O from electricity use can be calculated utilizing equations III.6B and Table C.2. Based upon calculations in section 4.3 above, the project would be expected to utilize no more than 70,800 kWh per year over existing uses. Therefore, the proposed project would generate 23.118 Metric Tons of CO_2e from electricity usage. The equivalent CO_2e emissions are calculated in Table 5.2 below.

Table 5.2: Total GHG Emissions Factors (Electricity Usage)

GHG	Emission Factor eGRID Subregion WECC California (lbs/KWh)	Energy Usage (KWh)	Conversion lbs/metric ton	Total (Metric Tons)	GWP	CO_2e (Metric Tons)
CO_2	0.724	1,498,185.00	2,204.62	23.01818	1	23.018
CH_4	0.000030	1,498,185.00	2,204.62	0.00096	21	0.020
N_2O	0.0000081	1,498,185.00	2,204.62	0.00026	310	0.080
Total						**23.118**
Note: Data is presented in decimal format and may have rounding errors.						

5.4 Project Related Solid Waste Emissions Gas Usage

Based upon methods discussed in Section 4.4 of this report, it was determined that the Project would generate 89.90 tons of solid waste each year. Utilizing the EPA's waste breakdown emission factors for each trash type and multiplying those factors with the projected waste generation yields estimates for equivalent CO_2 of 18.41 Metric Tons for the proposed project as shown in Table 5.3 on the following page.

Table 5.3: Total GHG Emissions Factors (Solid Waste)

Waste Type	Waste Breakdown	Landfill Emission Factors (MTCO2e per Ton)	Waste (Tons)	MTCO2e after breakdown each year (Metric Tons)
Special Waste	1.5%	0.42	1.35	0.57
Mixed Residue	2.5%	0.04	2.25	0.09
Paper	19.6%	0.35	17.62	6.17
Glass	2.4%	0.04	2.16	0.09
Metal	4.0%	0.04	3.60	0.14
Electronics	0.7%	0.04	0.63	0.03
Plastic	9.2%	0.04	8.27	0.33
Other Organics	48.6%	0.24	43.69	10.49
Inert and Other	11.2%	0.04	10.07	0.40
HHW	0.3%	0.40	0.27	0.11
Total CO_2E			**89.90**	**18.41**
Note: Data is presented in decimal format and may have rounding errors.				

5.5 Project Related Water Usage

Based on methods identified within Section 4.5, the project would most likely require 6,417,315.83 GPY and the estimated worst case energy use required to pump that water would be 71,302.80 kWh each year. Given this, the project is expected to create approximately 23.52 Metric Tons of CO_2e per year as shown in Table 5.4 below.

Table 5.4: Total GHG Emissions Factors (Electricity from Water Usage)

GHG	Emission Factor eGRID Subregion WECC California (lbs/KWh)	Energy Usage (KWh)	Conversion lbs/metric ton	Total (Metric Tons)	GWP	CO_2e (Metric Tons)
CO_2	0.72412	71,302.80	2,204.62	23.41981	1	23.420
CH_4	0.000030	71,302.80	2,204.62	0.00098	21	0.021
N_2O	0.0000081	71,302.80	2,204.62	0.00026	310	0.081
Total						**23.522**
Note: Data is presented in decimal format and may have rounding errors.						

5.6 Project Cumulative Totals

Cumulatively, the project will emit approximately 513 Metric Tons of CO2e each year. This is below the CAPCOA and City of San Diego acceptable 900 Metric Ton screening threshold and no project related design features would be required. Therefore, the project would be considered compliant with AB32 and no further analysis is warranted. A summary of the totals is shown in Table 5.5 below:

Table 5.5: Expected CO_2e Emissions Summary

CO_2e Generator	CO_2e (Metric Tons)
Construction	13.09
Vehicular Usage	434.83
Electricity Usage	23.12
Solid Waste Emissions	18.41
Water Usage Emissions	23.52
Project Totals (Business as Usual)	**512.96**

Expected Construction emissions are based upon URBEMIS modeling assumptions identified in Chapter 4 of this report.
* Total Construction related CO_2 averaged over a 30-year span.
Data is presented in decimal format and may have rounding errors.

6.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the projected CO_2e emissions from the proposed project development based upon the best available information at the time of preparation. The report was prepared utilizing the latest emission rates and reduction methodologies.

DRAFT

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Date December 1, 2014

ATTACHMENT A

URBEMIS 2007

12/1/2014 8:02:47 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Googledrive\Correia Middle School\11-30-14\Correia Sports Complex Weekday.urb924

Project Name: Correia Sports Field Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

12/1/2014 8:02:47 PM

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017 TOTALS (tons/year unmitigated)	0.29	1.56	2.16	0.00	1.43	0.09	1.52	0.30	0.08	0.38	394.05
2018 TOTALS (tons/year unmitigated)	0.03	0.13	0.21	0.00	0.00	0.01	0.01	0.00	0.01	0.01	38.68

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.03	0.01	0.29	0.00	0.00	0.00	11.09

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.29	0.42	3.50	0.00	0.95	0.18	529.61

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.32	0.43	3.79	0.00	0.95	0.18	540.70

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

12/1/2014 8:02:47 PM

2017	0.29	1.56	2.16	0.00	1.43	0.09	1.52	0.30	0.08	0.38	394.05
Mass Grading 02/01/2017-02/28/2017	0.02	0.17	0.12	0.00	0.92	0.01	0.93	0.19	0.01	0.20	39.59
Mass Grading Dust	0.00	0.00	0.00	0.00	0.92	0.00	0.92	0.19	0.00	0.19	0.00
Mass Grading Off Road Diesel	0.02	0.11	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	18.44
Mass Grading On Road Diesel	0.01	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.13
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02
Fine Grading 03/01/2017-03/15/2017	0.01	0.06	0.05	0.00	0.51	0.00	0.51	0.11	0.00	0.11	10.70
Fine Grading Dust	0.00	0.00	0.00	0.00	0.51	0.00	0.51	0.11	0.00	0.11	0.00
Fine Grading Off Road Diesel	0.01	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.14
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56
Trenching 03/01/2017-03/15/2017	0.01	0.08	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	10.17
Trenching Off Road Diesel	0.01	0.08	0.06	0.00	0.00	0.01	0.01	0.00	0.01	0.01	9.46
Trenching Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
Building 03/16/2017-02/01/2018	0.25	1.26	1.91	0.00	0.01	0.07	0.08	0.00	0.07	0.07	333.59
Building Off Road Diesel	0.22	1.21	1.04	0.00	0.00	0.07	0.07	0.00	0.06	0.06	193.70
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84
Building Worker Trips	0.03	0.04	0.87	0.00	0.01	0.00	0.01	0.00	0.00	0.01	139.05
2018	0.03	0.13	0.21	0.00	0.00	0.01	0.01	0.00	0.01	0.01	38.68
Building 03/16/2017-02/01/2018	0.03	0.13	0.21	0.00	0.00	0.01	0.01	0.00	0.01	0.01	38.68
Building Off Road Diesel	0.02	0.13	0.12	0.00	0.00	0.01	0.01	0.00	0.01	0.01	22.46
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.12

12/1/2014 8:02:47 PM

Phase Assumptions

Phase: Fine Grading 3/1/2017 - 3/15/2017 - Finish Grading the site

Total Acres Disturbed: 7.3

Maximum Daily Acreage Disturbed: 1.82

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 625 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 2/1/2017 - 2/28/2017 - Grubbing and removing pipes and debris

Total Acres Disturbed: 7.3

Maximum Daily Acreage Disturbed: 1.82

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 625 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 500

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 3/1/2017 - 3/15/2017 - Trenching for irrigation and utilities

Off-Road Equipment:

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

Phase: Building Construction 3/16/2017 - 2/1/2018 - concessions and restrooms

12/1/2014 8:02:47 PM

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.00	0.01	0.01	0.00	0.00	0.00	10.58
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscape	0.02	0.00	0.28	0.00	0.00	0.00	0.51
Consumer Products	0.00						
Architectural Coatings	0.01						
TOTALS (tons/year, unmitigated)	0.03	0.01	0.29	0.00	0.00	0.00	11.09

Area Source Changes to Defaults

12/1/2014 8:02:47 PM

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Junior high school	0.05	0.07	0.59	0.00	0.16	0.03	88.49
City park	0.24	0.35	2.91	0.00	0.79	0.15	441.12
TOTALS (tons/year, unmitigated)	0.29	0.42	3.50	0.00	0.95	0.18	529.61

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2018 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Junior high school		13.00	1000 sq ft	5.00	65.00	505.70
City park		48.43	acres	7.00	339.01	2,528.17
					404.01	3,033.87

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.3	0.0	99.8	0.2
Light Truck < 3750 lbs	10.8	0.0	97.2	2.8
Light Truck 3751-5750 lbs	22.0	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.7	0.0	100.0	0.0

12/1/2014 8:02:47 PM

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.7	0.0	57.1	42.9
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.6	41.7	58.3	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Junior high school				20.0	10.0	70.0
City park				5.0	2.5	92.5

ATTACHMENT B

EMFAC2007 2020 input/output

state average 2020

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/05 21:40:09
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego
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*****

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego Basin Average Basin Average

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Methane Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	0.013	0.017	0.000	0.000	0.000	0.000	0.014
35	0.011	0.015	0.000	0.000	0.000	0.000	0.013

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	1.305	1.645	0.000	0.000	0.000	0.000	1.440
35	1.206	1.519	0.000	0.000	0.000	0.000	1.330

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	0.137	0.176	0.000	0.000	0.000	0.000	0.153
35	0.130	0.168	0.000	0.000	0.000	0.000	0.145

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	333.683	423.325	0.000	0.000	0.000	0.000	369.232
35	303.711	385.409	0.000	0.000	0.000	0.000	336.109

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	0.003	0.004	0.000	0.000	0.000	0.000	0.004
35	0.003	0.004	0.000	0.000	0.000	0.000	0.003

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	0.011	0.025	0.000	0.000	0.000	0.000	0.017
35	0.010	0.021	0.000	0.000	0.000	0.000	0.014

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	0.008	0.008	0.000	0.000	0.000	0.000	0.008
35	0.008	0.008	0.000	0.000	0.000	0.000	0.008

Pollutant Name: PM10 - Brake Wear Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	0.013	0.013	0.000	0.000	0.000	0.000	0.013
35	0.013	0.013	0.000	0.000	0.000	0.000	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	26.382	20.784	0.000	0.000	0.000	0.000	24.167
35	28.986	22.835	0.000	0.000	0.000	0.000	26.552

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 60%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
30	28.569	29.080	0.000	0.000	0.000	0.000	28.998
35	28.569	29.080	0.000	0.000	0.000	0.000	28.998

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/05 21:40:09
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego
****
*****

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego Basin Average Basin Average

Table 2: Starting Emissions (grams/trip)

Pollutant Name: Methane Temperature: 60F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.002	0.002	0.000	0.000	0.000	0.000	0.002
10	0.004	0.003	0.000	0.000	0.000	0.000	0.004
20	0.008	0.007	0.000	0.000	0.000	0.000	0.007
30	0.011	0.009	0.000	0.000	0.000	0.000	0.010
40	0.014	0.012	0.000	0.000	0.000	0.000	0.013
50	0.016	0.014	0.000	0.000	0.000	0.000	0.016
60	0.018	0.017	0.000	0.000	0.000	0.000	0.018
120	0.024	0.023	0.000	0.000	0.000	0.000	0.024
180	0.019	0.018	0.000	0.000	0.000	0.000	0.018
240	0.020	0.019	0.000	0.000	0.000	0.000	0.020
300	0.021	0.020	0.000	0.000	0.000	0.000	0.021
360	0.022	0.022	0.000	0.000	0.000	0.000	0.022
420	0.023	0.023	0.000	0.000	0.000	0.000	0.023
480	0.024	0.024	0.000	0.000	0.000	0.000	0.024
540	0.025	0.025	0.000	0.000	0.000	0.000	0.025
600	0.026	0.026	0.000	0.000	0.000	0.000	0.026
660	0.026	0.027	0.000	0.000	0.000	0.000	0.027
720	0.027	0.028	0.000	0.000	0.000	0.000	0.027

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.426	0.450	0.000	0.000	0.000	0.000	0.436
10	0.838	0.886	0.000	0.000	0.000	0.000	0.856
20	1.617	1.719	0.000	0.000	0.000	0.000	1.656
30	2.339	2.498	0.000	0.000	0.000	0.000	2.401
40	3.003	3.226	0.000	0.000	0.000	0.000	3.089
50	3.610	3.901	0.000	0.000	0.000	0.000	3.722
60	4.159	4.523	0.000	0.000	0.000	0.000	4.300
120	5.918	6.538	0.000	0.000	0.000	0.000	6.157

180	4.104	4.737	0.000	0.000	0.000	0.000	4.349
240	4.338	5.076	0.000	0.000	0.000	0.000	4.623
300	4.554	5.380	0.000	0.000	0.000	0.000	4.873
360	4.751	5.649	0.000	0.000	0.000	0.000	5.098
420	4.930	5.884	0.000	0.000	0.000	0.000	5.298
480	5.090	6.084	0.000	0.000	0.000	0.000	5.474
540	5.232	6.250	0.000	0.000	0.000	0.000	5.625
600	5.356	6.381	0.000	0.000	0.000	0.000	5.751
660	5.461	6.477	0.000	0.000	0.000	0.000	5.853
720	5.548	6.538	0.000	0.000	0.000	0.000	5.930

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.103	0.216	0.000	0.000	0.000	0.000	0.147
10	0.120	0.236	0.000	0.000	0.000	0.000	0.165
20	0.150	0.271	0.000	0.000	0.000	0.000	0.197
30	0.174	0.301	0.000	0.000	0.000	0.000	0.223
40	0.194	0.325	0.000	0.000	0.000	0.000	0.245
50	0.208	0.344	0.000	0.000	0.000	0.000	0.260
60	0.217	0.357	0.000	0.000	0.000	0.000	0.271
120	0.228	0.383	0.000	0.000	0.000	0.000	0.287
180	0.236	0.396	0.000	0.000	0.000	0.000	0.298
240	0.234	0.393	0.000	0.000	0.000	0.000	0.296
300	0.232	0.389	0.000	0.000	0.000	0.000	0.293
360	0.229	0.383	0.000	0.000	0.000	0.000	0.288
420	0.225	0.375	0.000	0.000	0.000	0.000	0.283
480	0.220	0.365	0.000	0.000	0.000	0.000	0.276
540	0.214	0.354	0.000	0.000	0.000	0.000	0.268
600	0.208	0.341	0.000	0.000	0.000	0.000	0.259
660	0.200	0.326	0.000	0.000	0.000	0.000	0.249
720	0.192	0.309	0.000	0.000	0.000	0.000	0.237

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	11.569	14.677	0.000	0.000	0.000	0.000	12.769
10	13.259	16.776	0.000	0.000	0.000	0.000	14.617
20	17.095	21.555	0.000	0.000	0.000	0.000	18.817
30	21.538	27.109	0.000	0.000	0.000	0.000	23.688
40	26.588	33.437	0.000	0.000	0.000	0.000	29.232
50	32.247	40.540	0.000	0.000	0.000	0.000	35.448
60	38.512	48.418	0.000	0.000	0.000	0.000	42.336
120	87.451	110.293	0.000	0.000	0.000	0.000	96.269
180	99.548	125.505	0.000	0.000	0.000	0.000	109.569
240	111.561	140.621	0.000	0.000	0.000	0.000	122.780
300	123.492	155.642	0.000	0.000	0.000	0.000	135.903
360	135.338	170.569	0.000	0.000	0.000	0.000	148.939
420	147.101	185.400	0.000	0.000	0.000	0.000	161.887
480	158.781	200.136	0.000	0.000	0.000	0.000	174.746
540	170.377	214.777	0.000	0.000	0.000	0.000	187.518
600	181.890	229.323	0.000	0.000	0.000	0.000	200.202
660	193.319	243.775	0.000	0.000	0.000	0.000	212.798

state average 2020

720	204.665	258.131	0.000	0.000	0.000	0.000	225.305

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
60	0.000	0.001	0.000	0.000	0.000	0.000	0.000
120	0.001	0.001	0.000	0.000	0.000	0.000	0.001
180	0.001	0.001	0.000	0.000	0.000	0.000	0.001
240	0.001	0.001	0.000	0.000	0.000	0.000	0.001
300	0.001	0.002	0.000	0.000	0.000	0.000	0.001
360	0.001	0.002	0.000	0.000	0.000	0.000	0.002
420	0.001	0.002	0.000	0.000	0.000	0.000	0.002
480	0.002	0.002	0.000	0.000	0.000	0.000	0.002
540	0.002	0.002	0.000	0.000	0.000	0.000	0.002
600	0.002	0.002	0.000	0.000	0.000	0.000	0.002
660	0.002	0.002	0.000	0.000	0.000	0.000	0.002
720	0.002	0.003	0.000	0.000	0.000	0.000	0.002

Pollutant Name: PM10 Temperature: 60F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.001	0.001	0.000	0.000	0.000	0.000	0.001
10	0.001	0.003	0.000	0.000	0.000	0.000	0.002
20	0.002	0.005	0.000	0.000	0.000	0.000	0.003
30	0.003	0.007	0.000	0.000	0.000	0.000	0.005
40	0.005	0.010	0.000	0.000	0.000	0.000	0.007
50	0.006	0.012	0.000	0.000	0.000	0.000	0.008
60	0.006	0.014	0.000	0.000	0.000	0.000	0.009
120	0.010	0.022	0.000	0.000	0.000	0.000	0.015
180	0.011	0.025	0.000	0.000	0.000	0.000	0.016
240	0.012	0.027	0.000	0.000	0.000	0.000	0.018
300	0.013	0.029	0.000	0.000	0.000	0.000	0.019
360	0.014	0.030	0.000	0.000	0.000	0.000	0.020
420	0.015	0.032	0.000	0.000	0.000	0.000	0.021
480	0.015	0.033	0.000	0.000	0.000	0.000	0.022
540	0.015	0.034	0.000	0.000	0.000	0.000	0.022
600	0.016	0.034	0.000	0.000	0.000	0.000	0.023
660	0.016	0.035	0.000	0.000	0.000	0.000	0.023
720	0.016	0.035	0.000	0.000	0.000	0.000	0.023

state average 2020
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/05 21:40:09
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego
****
Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego Basin Average Basin Average

Table 4: Hot Soak Emissions (grams/trip)

Pollutant Name: Methane Temperature: 60F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Hot soak results are scaled to reflect zero emissions for trip lengths of less than 5 minutes (about 25% of in-use trips).

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/05 21:40:09
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego
****
Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego Basin Average Basin Average

Table 5a: Partial Day Diurnal Loss Emissions (grams/hour)

Pollutant Name: Methane Temperature: ALL Relative Humidity: ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/05 21:40:09
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego
****
*****
Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego Basin Average Basin
Average

Table 5b: Multi-Day Diurnal Loss Emissions
(grams/hour)

Pollutant Name: Methane Temperature: ALL Relative Humidity:
ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/05 21:40:09
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego
****
*****
Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego Basin Average Basin
Average

Table 6a: Partial Day Resting Loss Emissions
(grams/hour)

Pollutant Name: Methane Temperature: ALL Relative Humidity:
ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/05 21:40:09
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego
****
*****
Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego Basin Average Basin
Average

Table 6b: Multi-Day Resting Loss Emissions
(grams/hour)

Pollutant Name: Methane Temperature: ALL Relative Humidity:
ALL

Temp degF	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/05 21:40:09
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego
****
*****
Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego Basin Average Basin
Average

Table 7: Estimated Travel Fractions

Pollutant Name: Temperature: ALL Relative Humidity:
ALL

	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
%VMT	0.603	0.397	0.000	0.000	0.000	0.000	1.000
%TRIP	0.614	0.386	0.000	0.000	0.000	0.000	1.000
%VEH	0.612	0.388	0.000	0.000	0.000	0.000	1.000

Title : 2020 BAU
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/05 21:40:09
Scen Year: 2020 -- All model years in the range 1976 to 2020 selected
Season : Annual
Area : San Diego
****
*****

Year: 2020 -- Model Years 1976 to 2020 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

San Diego Basin Average Basin Average

Table 8: Evaporative Running Loss Emissions (grams/minute)

Pollutant Name: Methane Temperature: 60F Relative Humidity: ALL

Time min	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000
35	0.000	0.000	0.000	0.000	0.000	0.000	0.000
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
55	0.000	0.000	0.000	0.000	0.000	0.000	0.000
60	0.000	0.000	0.000	0.000	0.000	0.000	0.000